

The Role of the Mobile Air Conditioning Industry in Solving Global Warming and Oil Dependency

Roland J. Hwang
Vehicles Policy Director
Air & Energy Program
Natural Resources Defense Council
rhwang@nrdc.org
www.nrdc.org

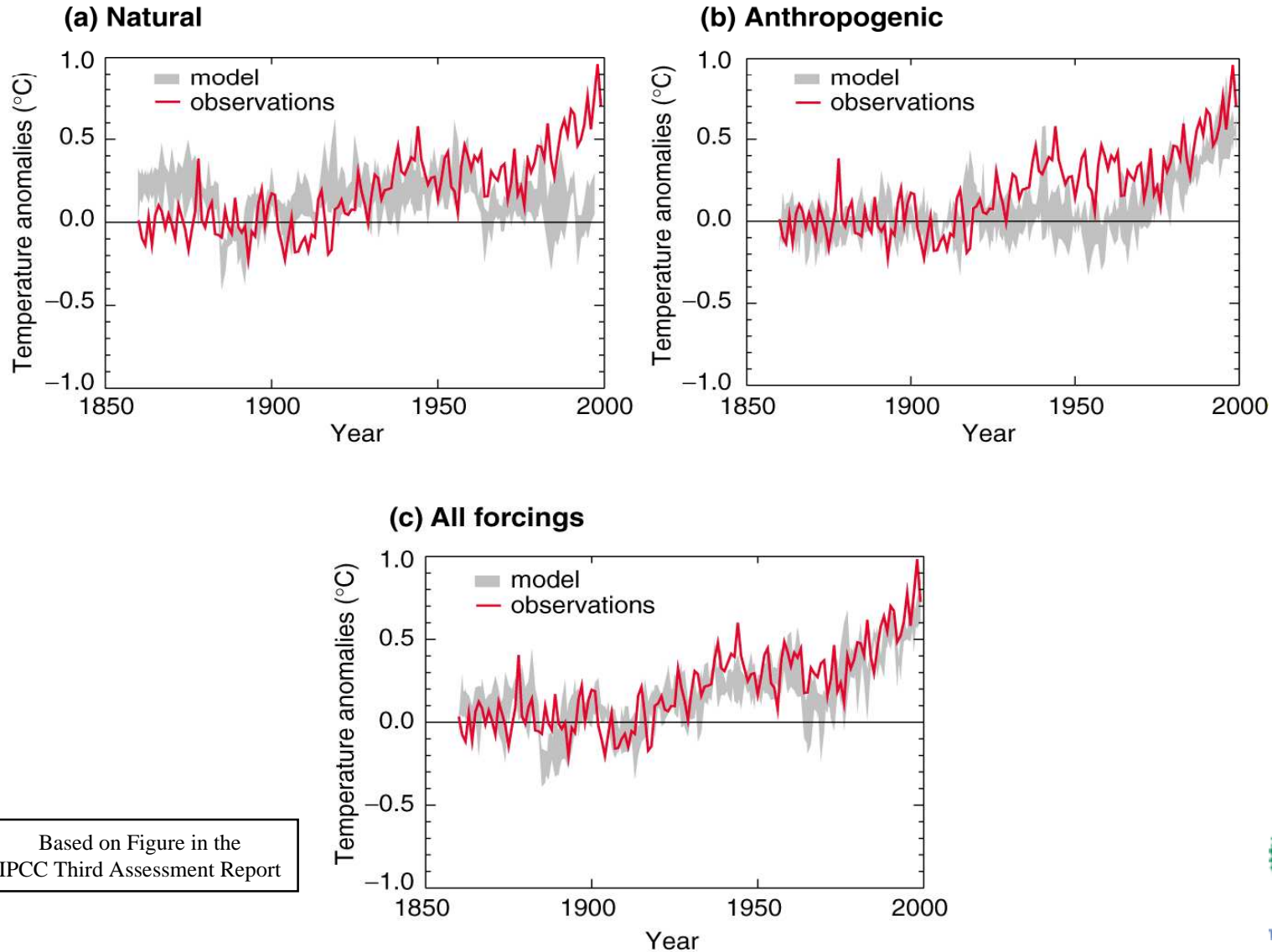
MAC Summit 2005
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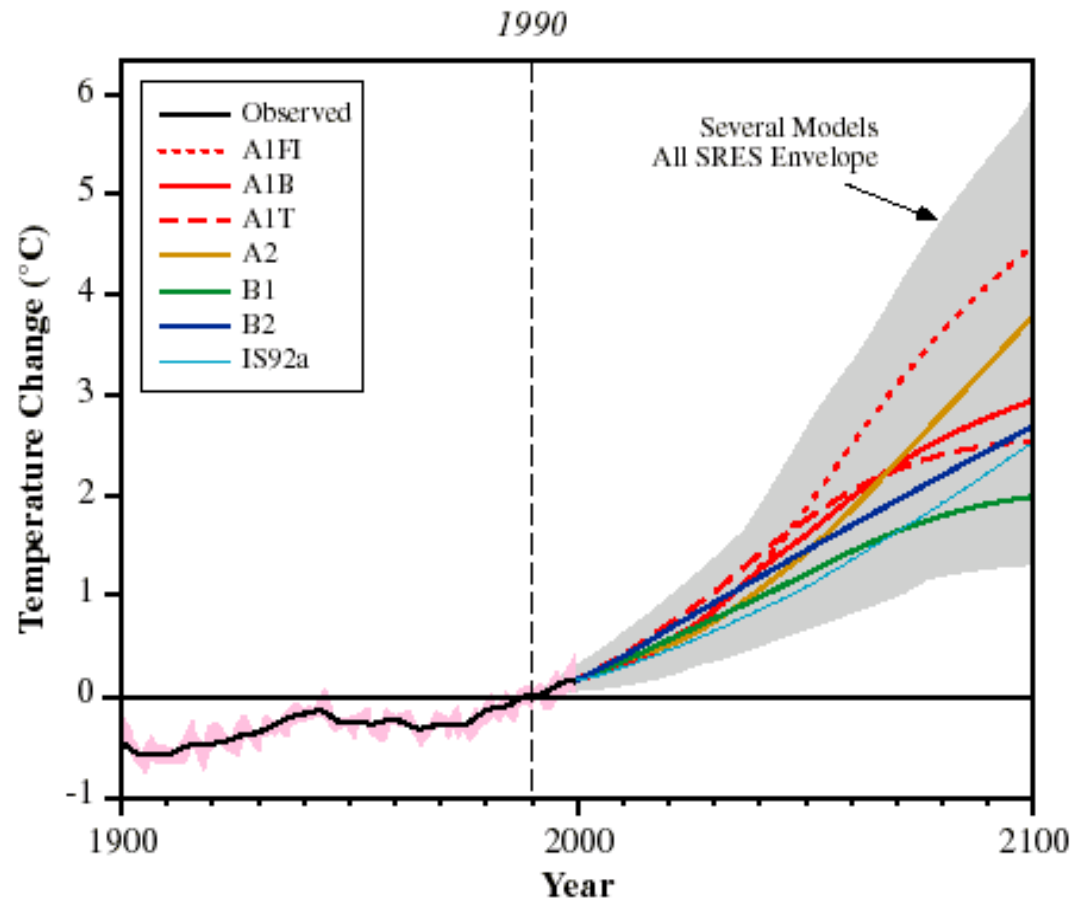
Overview

- Motor vehicles are a major cause of global warming and oil dependency
- Increasingly broad support, domestically and internationally, for policy actions to address these problems
- Industry can no longer plan on “business as usual”; investments must be made now in order to compete in an increasingly carbon and oil constrained global market

Global Warming Signal Is Clear

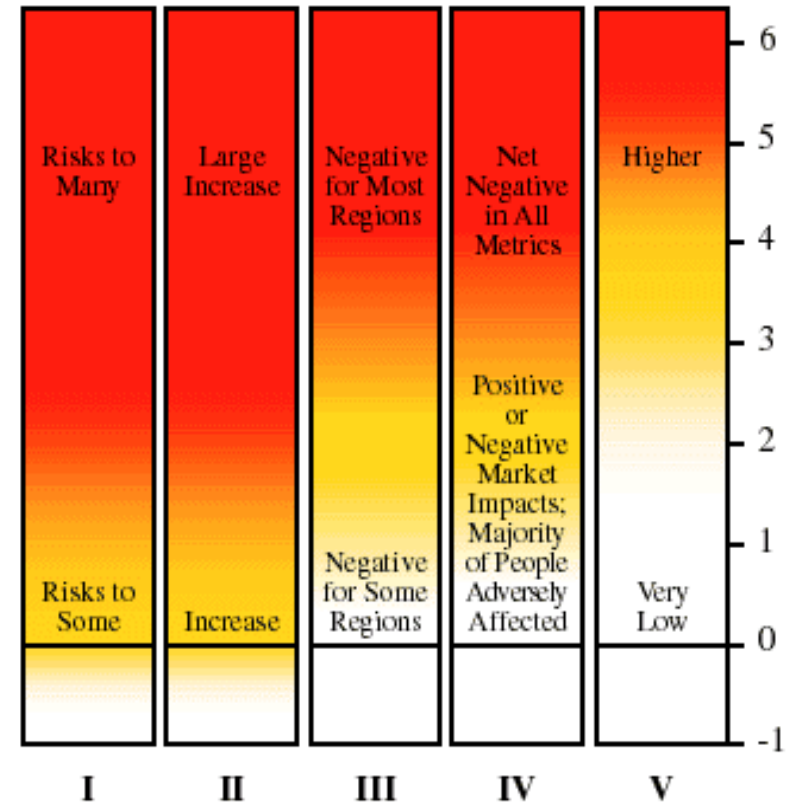


Higher Emissions = Higher Risks



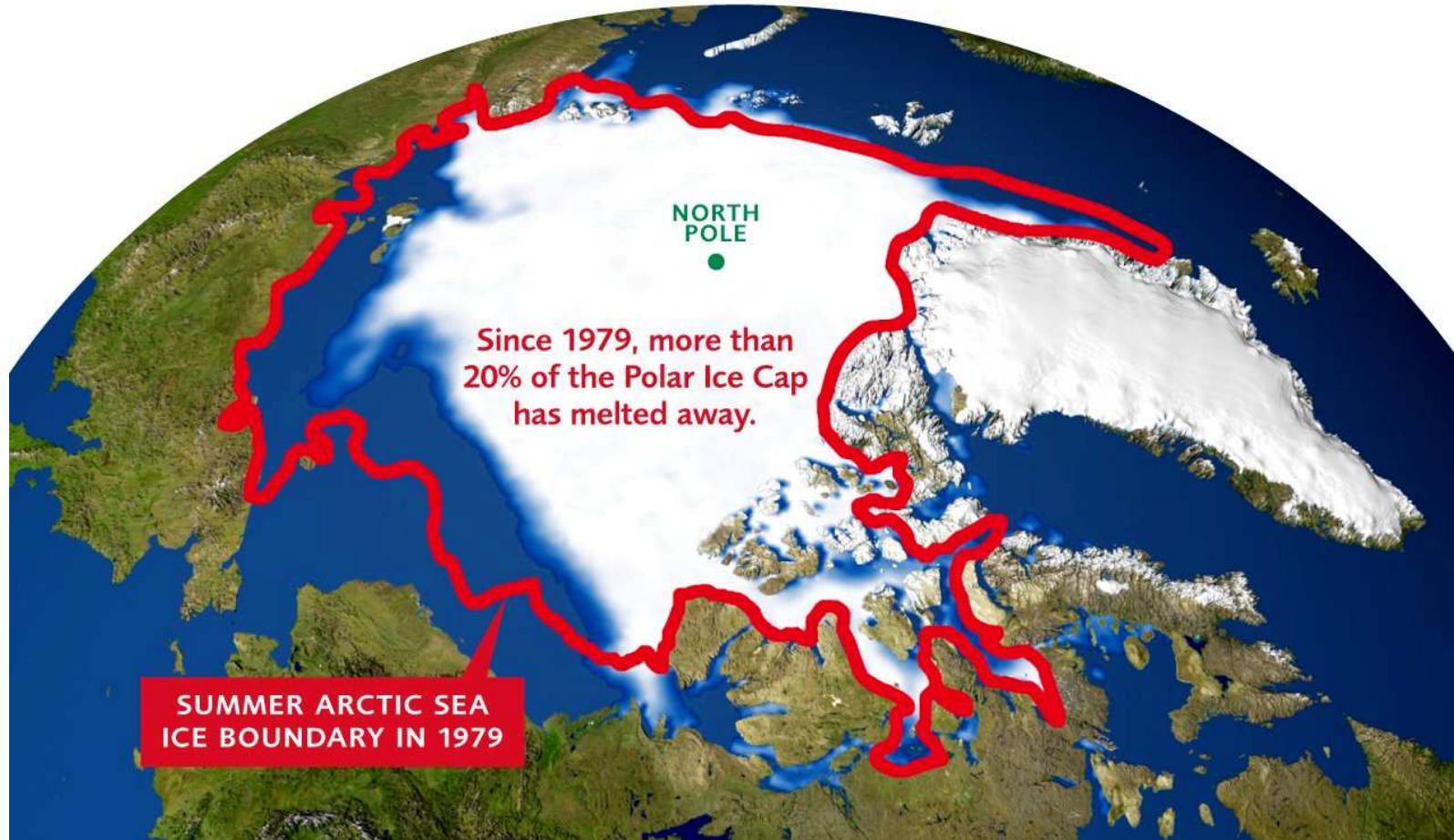
Source: IPCC TAR, 2001

Reasons for Concern



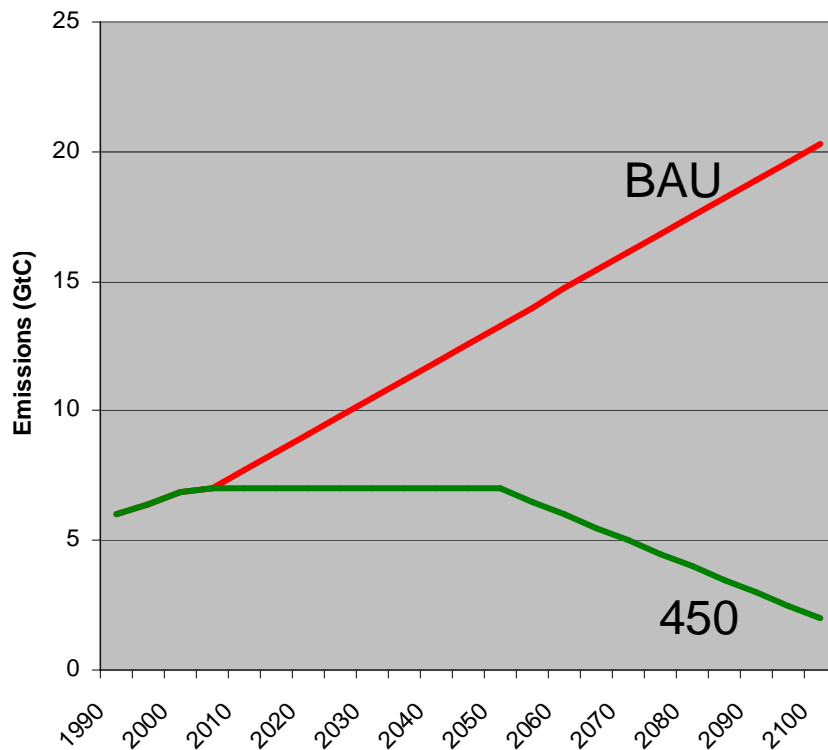
- I Risks to Unique and Threatened Systems
- II Risks from Extreme Climate Events
- III Distribution of Impacts
- IV Aggregate Impacts
- V Risks from Future Large-Scale Discontinuities

The Ice Caps Are Melting

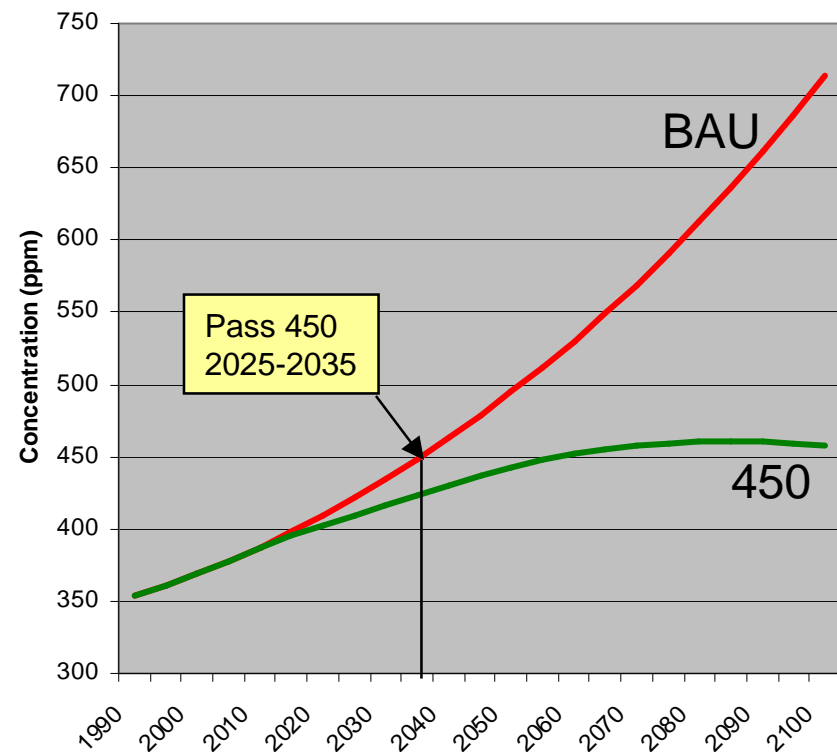


Climate Stabilization Means Cutting Emissions Now!

Global Carbon Emissions



CO₂ Concentration



Growing Support for National Action: The Climate Stewardship Act

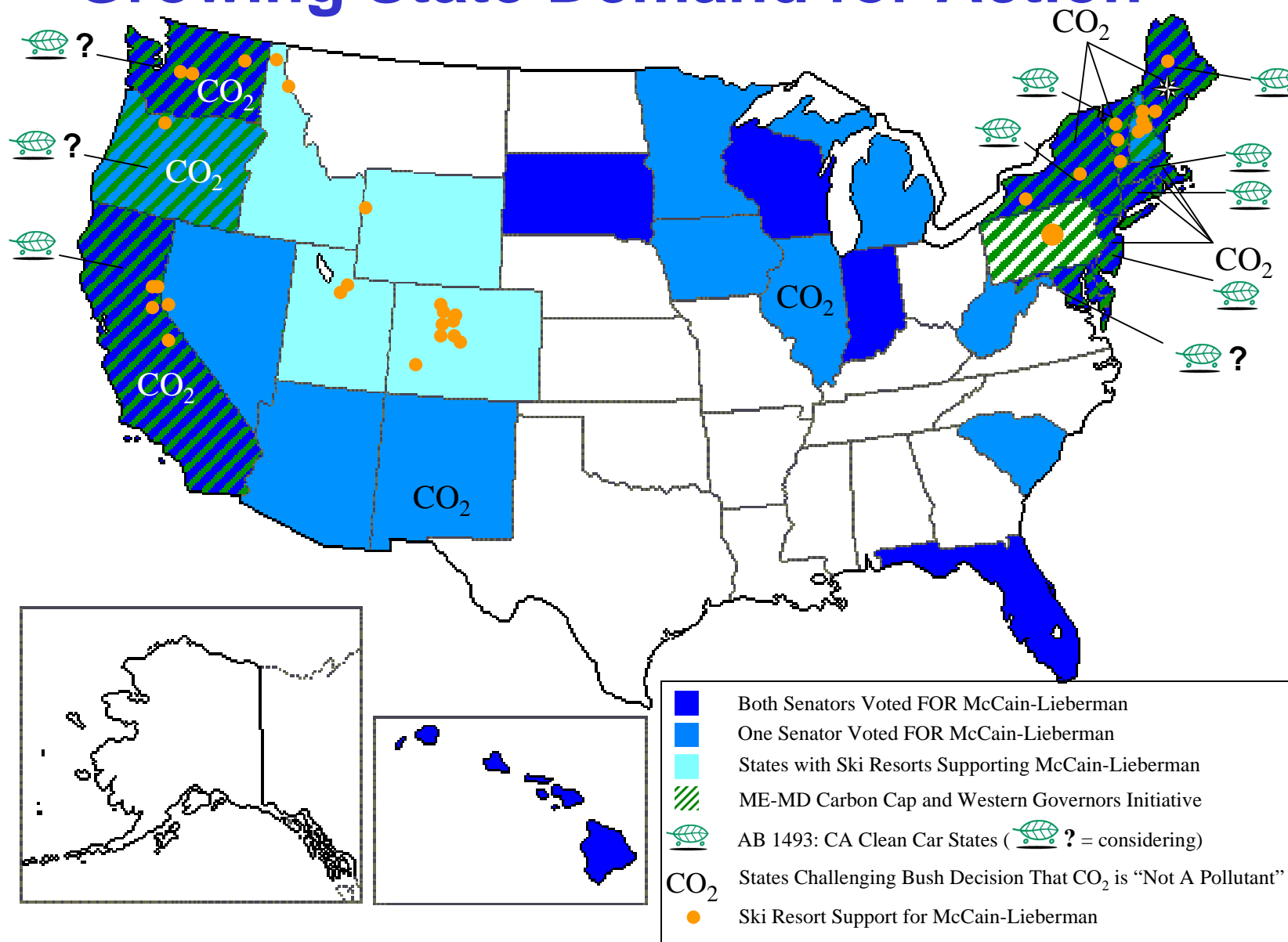
- National cap on global warming pollution
- Market-based system allows permit trading across companies, gases, sectors
- Drives investment in clean technology



States Are Leading the Way on Solving Global Warming

- California leads the way with first ever US vehicle global warming pollution standards
 - California pollution standards have for the past 40 years acted as a model for national standards
- California's program is spreading
 - 25% of nation's new vehicle sales already have California's motor vehicle pollution standards (NY, MA, VT, MN, NJ, CT, RI)
 - Other states considering legislation: Maryland, Oregon, Washington

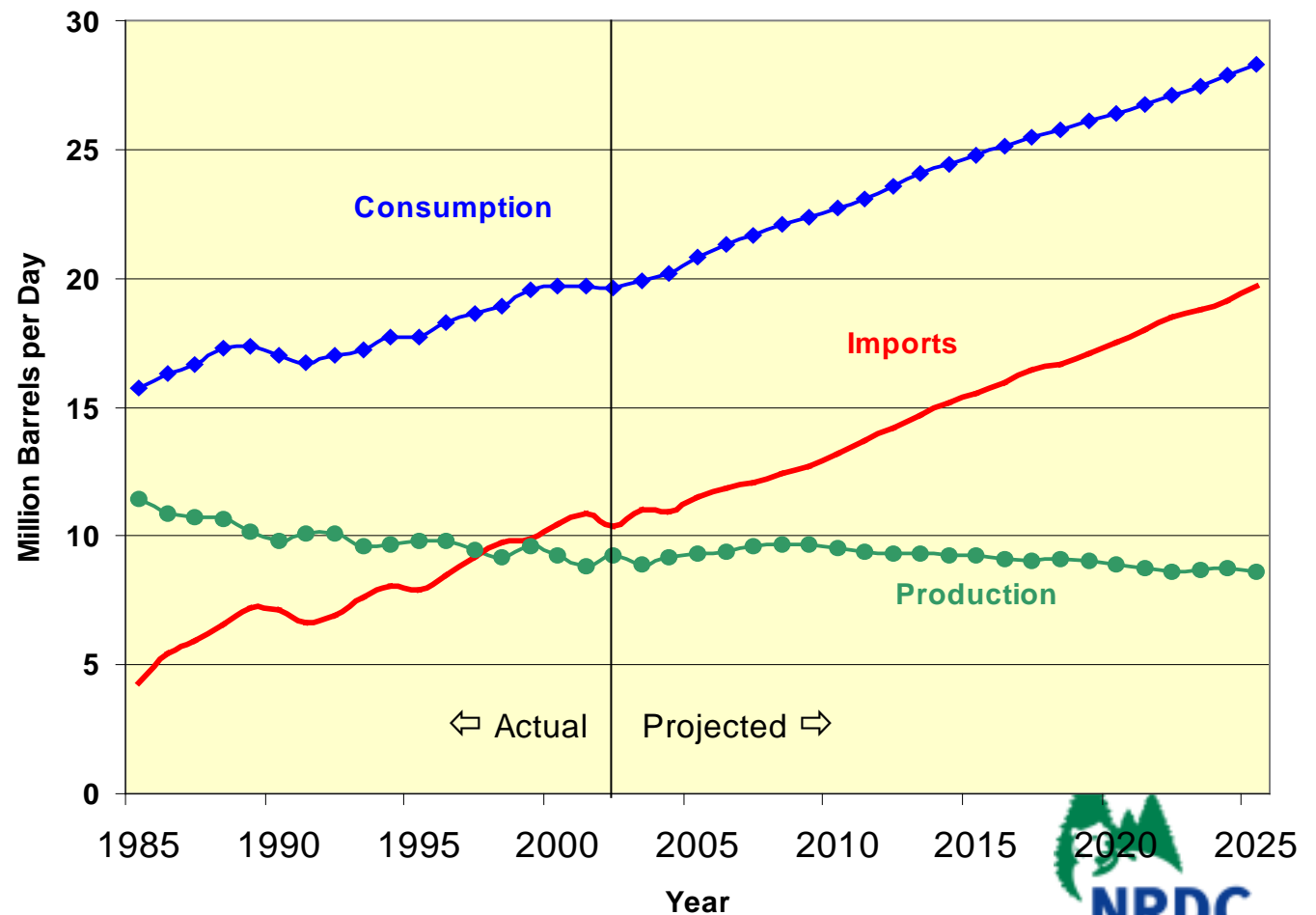
Growing State Demand for Action



Energy Security is a Growing Problem

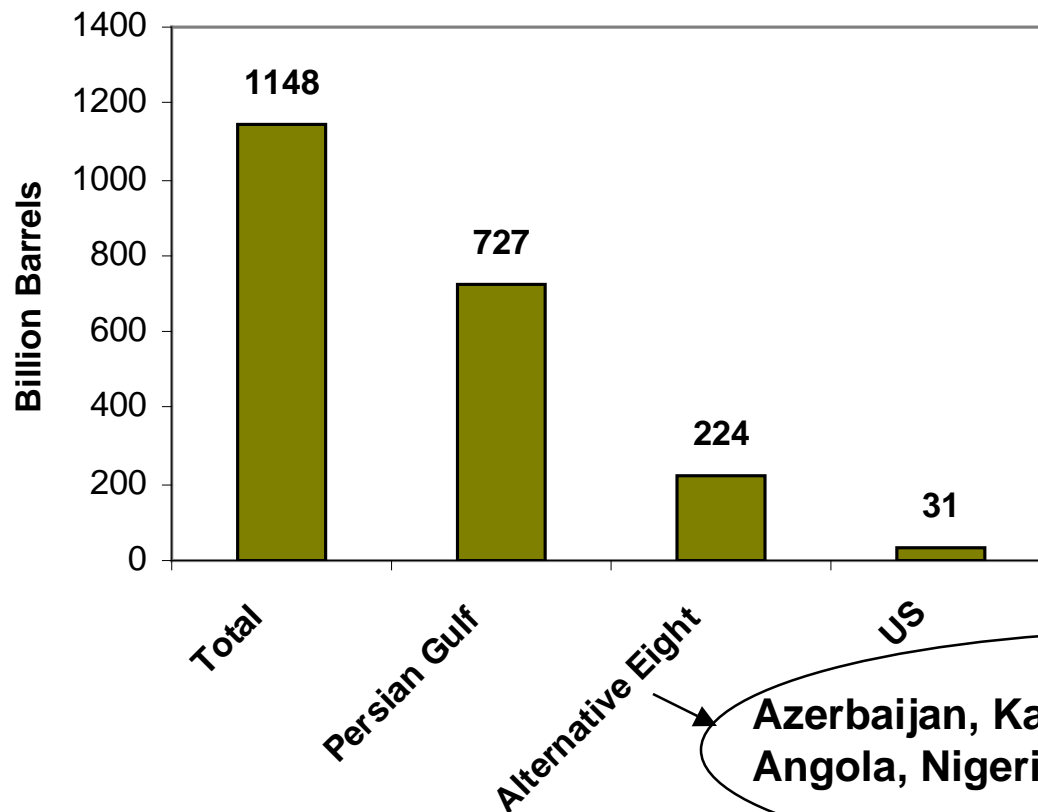
Oil imports rising to 70% demand by 2025

- \$103 billion exported for oil in 2004
- \$17 million spent on oil every hour
- 1/5th trade deficit due to oil in 2004



Global Reliance on Persian Gulf is Growing

Proven Reserves (end of 2003)



- Persian Gulf has 2/3 world's proven oil reserves while US has just 3%
- U.S. National Energy Plan is essentially to secure supply from Persian Gulf and increase supply from potentially unstable, hostile countries (so-called Alternative 8)



Growing Bipartisan Support for Action

- National Commission on Energy Policy
 - Bipartisan, multi-stakeholder commission
 - Recommends cutting oil dependency and global warming emissions through standards and incentives
- Hawks and Religious Groups
 - Neocons: Strengthening National Security requires reducing dependency on Middle East
 - Religious Groups: Religious freedom and social justice



<http://www.energycommission.org/>



Hawks and Greens Agree: US Must Reduce its Oil Dependency

- Defense and foreign policy experts: oil dependency is an “incipient national emergency”
- Problem: Increasing dependency on Middle East oil and vulnerability of oil infrastructure to terrorist attack
- Solution: National commitment to save 2.5 mmbd in 10 years
- Institute for Advancement of Global Security founded by James Woolsey (www.iags.org)

SECURING AMERICA

Solving Our Oil Dependence Through Innovation



Joint report by:



<http://www.nrdc.org/air/transportation/oilsecurity/plan.pdf>

Solution: Clean Energy Now



Clean Car Technologies Exist

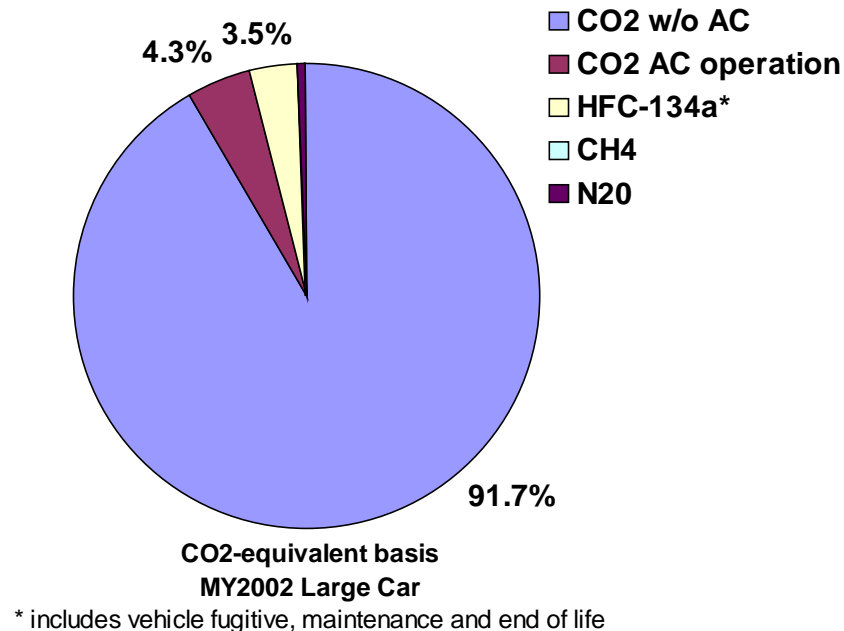
MAC reductions is an important part of the solution



Assessment based on NRDC's review of the literature, including recent studies by the National Academy of Sciences and U.S. Environmental Protection Agency

Importance of MAC Emissions

- 8% of total global warming pollution emissions on a per vehicle basis
- Largest source of non-CO₂ emissions (3.5%)
- Largest source of accessory related CO₂ emissions

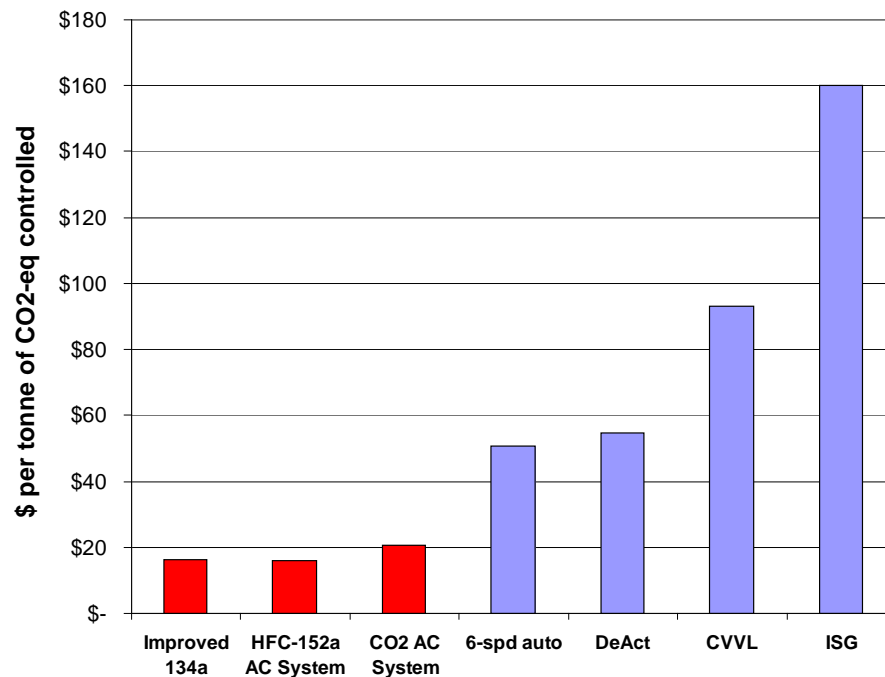


National Oil Savings Potential

- NREL estimates that Increasing energy efficiency of MAC systems could cut gasoline demand by 2.75%
 - 3.4 billion gallons per year
 - 220,000 barrels of oil per day
 - \$5.6 billion per year
 - 32 million tons of indirect CO₂ emissions per year

MAC Emission Controls Are Low Cost

- Improved MAC systems are very cost-effective compared to other options to reduce GHGs

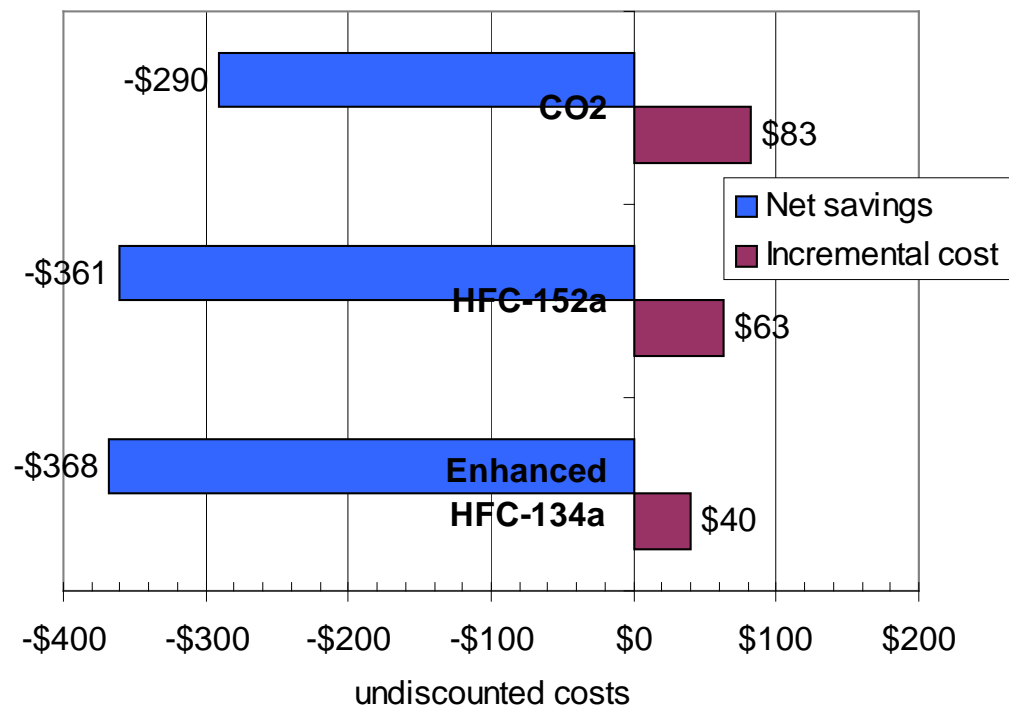


TECHNOLOGY DESCRIPTIONS:

- 6-spd auto: 6-speed automatic transmission
- DeAct: Cylinder Deactivation
- CVVL: Continuous Variable Valve Lift
- ISG: 42V Integrated Starter Generator

Extremely Cost-Effective to Consumer

- Incremental cost of \$40 to \$83 (NESCCAF 2004)
- Lifetime operating cost savings for fuel = \$300-375 (undisc)
- Enhanced 134a and 152a reduces one servicing = \$100
- Simple payback time of 2 to 4 years



Assumes MY 2002 large car, 200K mile, 16-year life and \$1.74/gallon
NRDC calculations based on CARB and NESCCAF data



Key Policy Approaches

- NRDC supports California approach:
 - Manufacturer has flexibility to choose pollutant (CO₂, HFC-134a, CH₄, N₂O) and technologies
 - All viable MAC options are allowed and credited (enhanced 134a, 152a and CO₂)
 - Component-specification compliance initially while new testing procedures are developed
- Raise fuel economy standards nationally and include AC operations in fuel economy testing and labeling procedures
- Voluntary I-MAC program to accelerate commercialization
- Effective, quantifiable, verifiable and enforceable controls on servicing and end of life emissions for HFC-134a



Conclusions

- MAC industry is, as is the entire motor vehicle industry, facing new, stricter controls on GHGs and fuel consumption, globally
- MAC industry has an opportunity to be part of the solution by better controlling emissions of current refrigerant, while accelerating the commercialization of alternative refrigerants
- Huge global market for new MAC technologies for those companies willing to demonstrate leadership

Will the MAC Industry be Part of the Solution or Part of the Problem?

JIM BORGMAN

